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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,883	01/23/2004	Michael Hensel	ICI 104 DIV	8282
23579	7590	04/03/2008	EXAMINER	
PATREA L. PABST PABST PATENT GROUP LLP 400 COLONY SQUARE, SUITE 1200 1201 PEACHTREE STREET ATLANTA, GA 30361			SHANNAN SHAH, KHATOL S	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/763,883

**Applicant(s)**

HENSEL ET AL.

**Examiner**

Khatol S. Shahnan-Shah

**Art Unit**

1645

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12/28/2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16, 22, 26, 27, 30-49, 69, 70 and 91-98 is/are pending in the application.
- 4a) Of the above claim(s) 1-16, 31-34, 41, 42, 69, 70 and 91-98 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22, 26, 30, 35-40 and 43-49 is/are rejected.
- 7) ☒ Claim(s) 27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Final Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **RESPONSE TO AMENDMENT**

1. The amendment filed 12/28/2007 has been entered into the record. Specification multiple pages has been amended to comply with priority and trademark rules. Claims 22, 27, 30, 31, 33, 35, 36, 37, 38, 39, 40, 43, 44, 45, 46, 47, 48, 49 have been amended. Claims 23, 24, 25, 28 and 29 have been canceled. Claims 17-21, 50-68, 71-90 and 99-100 have been cancelled by a previous amendment. Claims 1-16, 22, 26, 27, 30-49, 69, 70 and 91-98 are pending. Claims 22, 26, 27, 30, 35-40, 43-49 are under examination. Claims 1-16, 31-34, 41-42, 69-70 and 91-98 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to no-elected inventions.

### ***Election/Restrictions***

2. Applicants' arguments in regard to restriction requirement have been noted. Applicants request to rejoin claim 30 to group III is persuasive. Claim 30 will be examined with elected group III. In regard to applicants' request to join depended claims in view of amendments to modify dependency, Claims 31-35 and 41-42 are drawn to non-elected genes therefore those claims will not be joined with the elected group and stand withdrawn.

### ***Objections Withdrawn***

3. Objections to the specification made in paragraphs 3 and 4 of the office action mailed 6/28/2007 are withdrawn in view of applicants' amendments filed 12/28/2007.

### ***Rejections Moot***

4. Rejection of claims 23, 24, 25, 28 and 29 under 35 U.S.C. 101 double patenting conflicting with claims of Application No. 10/007,463 made in paragraph 8 of the office action mailed 6/28/2007 is moot in view of cancellation of said claims.

5. Rejection of claims 23, 24, 25, 28 and 29 under 35 U.S.C. 101 directed to non-statutory subject matter made in paragraph 10 of the office action mailed 6/28/2007 is moot in view of cancellation of said claims.

6. Rejection of claims 23, 24, 25, 28 and 29 under 35 U.S.C. 112 first paragraph written description made in paragraph 13 of the office action mailed 6/28/2007 is moot in view of cancellation of said claims.

7. Rejection of claims 24 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Hensel et al. made in paragraph 15 of the office action mailed 6/28/2007 is moot in view of cancellation of said claims.
8. Rejection of claims 24 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Shea et al. made in paragraph 16 of the office action mailed 6/28/2007 is moot in view of cancellation of said claims.
9. Rejection of claims 23, 24, 25, 28 and 29 are rejected under 35 U.S.C. 102(a) as being anticipated by Deiwick al. made in paragraph 17 of the office action mailed 6/28/2007 is moot in view of cancellation of said claims.

***Rejections Withdrawn***

10. Rejection of claims 22, 26, 27, 35-40 43-49 under 35 U.S.C. 101 double patenting conflicting with claims of Application No. 10/007,463 made in paragraph 8 of the office action mailed 6/28/2007 is withdrawn in view of abandonment of Application No. 10/007,463.
11. Rejection of claims 22, 26, 27, 35-40 43-49 under 35 U.S.C. 101 directed to non-statutory subject matter made in paragraph 10 of the office action mailed 6/28/2007 is withdrawn in view of applicants' amendments filed 12/28/2007.
12. Rejection of claim 27 under 35 U.S.C. 112 first paragraph directed to non-statutory subject matter made in paragraph 12 of the office action mailed 6/28/2007 is withdrawn in view of applicants' information and public availability of the strain.
13. Rejection of claims 22, 26, 27, 35-40 43-49 under 35 U.S.C. 112 first paragraph written description made in paragraph 13 of the office action mailed 6/28/2007 is withdrawn in view of applicants' amendments filed 12/28/2007.
14. Rejection of claims 22, 24, 25 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Hensel et al. made in paragraph 15 of the office action mailed 6/28/2007 is withdrawn in view of applicants' amendments filed 12/28/2007.
15. Rejection of claims 22, 24, 25, 26, 35, 38, 39, 40, 44, 45, 46, 47, 48 and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Shea et al. made in paragraph 16 of the office action mailed 6/28/2007 is withdrawn in view of applicants' amendments filed 12/28/2007.

***Rejections Maintained***

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

17. Rejection of claims 22, 26, 35, 37, 38, 39, 40, 45,46 and 49 are rejected under 35 U.S.C. 102(a) as being anticipated by Deiwick al. made in paragraph 17 of the office action mailed 6/28/2007 is maintained.

Applicant's arguments filed 12/28/2007 have been fully considered but they are not persuasive.

The applicant argues:

- Deiwick et al. is not available as prior art against the above-referenced application, and therefore, cannot anticipate the claimed subject matter. Applicants attach the Declaration under 37 C.F.R. 1.132 of Dr. Darren R. Ritsick who testifies that he contacted the Cushing/Whitney Medical Library at Yale University who advised him that the library received Deiwick et al. (Journal of Bacteriology, 180(18):4775-4780) on September 21, 1998. (see Exhibit A of Dr. Ritsick's Declaration). Dr. Ritsick also testifies that he contacted the Welch Medical Library at Johns Hopkins Medical Institutes who advised him that the library received Deiwick et al. (Journal of Bacteriology, 180 (18):4775-4780) on September 14, 1998 (see Exhibits B and C of Dr. Ritsick's Declaration). In view of Dr. Ritsick's declaration, Deiwick et al. was not publicly available until after the earliest effective filing date (September 4, 1998) for the above referenced application.
- Even if Deiwick et al. were considered to be prior art, Deiwick et al. fails to disclose attenuated mutants in which an sse gene has been inactivated.

Applicants draw the Examiner's attention to Tables 1 and 2 from which it can be seen that mutations in *sse* genes are not disclosed.

In response to applicants' arguments it should be mentioned that Journal of Bacteriology is a publication of American Society of Microbiology are available as both print and on-line membership to the society members ( see attached list of Journals) and they are available by the first of the month to subscribers. If the two above libraries had the journal available on later date then September 1<sup>st</sup> of 1998 does not prove that the above reference was not publicly available until after the earliest effective filing date.

As to Diewick et al. fails to disclose attenuated mutants in which an *sse* gene has been inactivated, Diewick et al. teach that inactivation of SPI2 genes resulted in dramatic attenuation of virulence and inability of mutant to colonize the spleen of infected animals. Diewick et al. teach SSE effectors gene of SPI2 locus (see page 4775, left column).

**18.** Rejection of claims 22, 40 and 43 are rejected under 35 U.S.C. 103(a), made in paragraph 19 of the office action mailed 6/28/2007 is maintained.

Applicant's arguments filed 12/28/2007 have been fully considered but they are not persuasive.

The applicant argues:

- The Court recognized that a showing of "teaching, suggestion, or motivation" to combine the prior art to meet the claimed subject matter could provide a helpful insight in determining whether the claimed subject matter is obvious under 35 U.S.C. § 103(a). Indeed, the examiner's attention is drawn to the following quote by the Court in KSR:
- *As discussed above, Diewick et al. is not prior art, and even if it were considered prior art, it does not disclose or suggest attenuated strains of Salmonella having at least one sse gene inactivated. Tsolis et al. does not cure this deficiency. Tsolis et al. is cited disclosing superoxide dismutase genes of Salmonella typhimurium. Because Diewick et al. is not prior art and because the*

combination of Deiwick et al. and Tsolis et al. does not disclose or suggest each element of the claims, the rejection should be withdrawn.

In response to applicants' arguments it is this office's position that under the TSM test, a claimed invention is obvious when there is a teaching, suggestion or motivation to combine prior art teachings. The teaching, suggestion or motivation may be found in the prior art, in the nature of the problem, or in the knowledge of a person having ordinary skill in the art. According to supreme court on KSR International Co. v. Teleflex Inc. 82 USPQ2d 1385, 1396 (2007), the TSM test is one of a number of valid rationales that could be used to determine obviousness. It is not the only rationale that maybe relied upon to support a conclusion of obviousness.

Deiwick et al. teach an attenuated gram-negative cell comprising the SPI2 gene locus, wherein at least one gene of the SPI2 locus is inactivated, wherein said inactivation results in an attenuation/reduction of virulence compared to the wild type of said cell. (see abstract and page 4776). Deiwick et al. teach enterobacteriaceae and *Salmonella typhimurium* cell (see bacterial strains, page 4775). Deiwick et al... teach broad host range for *Salmonella* species causing disease (see page 4775). Deiwick et al. teach insertion mutation and insertion cassettes (see pages 4776–4777 and fig 1). Deiwick et al. teach deletion mutations too (see page 4779 lack of SPI2 components). Deiwick et al. teach antibiotic resistance (see 4778). Deiwick et al. teach a gene outside of SPI2 locus (see page 4779). Deiwick et al. teach non-polar mutations (see page 4778). Deiwick et al. teach sse gene (see page 4775, left column).

Tsolis et al. teach superoxide dismutase genes (sodA and sodB) of *Salmonella typhimurium* (see abstract and pages 1741- 1743). Tsolis et al. also teach attenuated *Salmonella typhimurium* (see page 1743). Tsolis et al. also teach the role of superoxide dismutase genes (sodA and sodB) in protection of bacteria from oxidative killing (see page 1739).

It would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to combine the teachings of Deiwick et al., an attenuated gram-negative cell comprising the SPI2 gene locus, wherein at least one gene of the

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SPI2 locus is inactivated with the teachings of Tsolis et al. superoxide dismutase genes (sodA and sodB) of *Salmonella typhimurium* to obtain an attenuated gram-negative cell comprising the SPI2 gene locus, wherein at least one gene of the SPI2 locus is inactivated, wherein said inactivation results in an attenuation/reduction of virulence compared to the wild type of said cell. One of skilled in the art would have been motivated by the teaching of Deiwick et al. that mutations in Spi2 lead to strong reduction of virulence and certain mutations in Spi2 affect the ability of *Salmonella typhimurium* to secrete SPI1 effector proteins (see abstract). One of skilled in the art would have also been motivated by the teaching of Deiwick et al. that mutations in SPI2 affect the expression of SPI1 genes. Furthermore, mutations in SPI2 results in an altered resistance of *Salmonella typhimurium* to various antibiotics (see Deiwick et al. page 4775 right column second paragraph).

#### ***New Rejection***

19. Claim 30 is rejected under 35 U.S.C. 102(a) as being anticipated by Deiwick et al. (Journal of Bacteriology, Vol. 180, No.18, pp. 4775-4780, September 1, 1998). Claim 30 is drawn to a cell according to claim 22 wherein at least one sse gene is selected from the group consisting of sseC, sseD and sseE.

Deiwick et al. teach that inactivation of SPI2 genes resulted in dramatic attenuation of virulence and inability of mutant to colonize the spleen of infected animals. Deiwick et al. teach sse effectors gene of SPI2 locus and their specific chaperons ssc (see page 4775, left column).

#### ***Status of Claims***

20. No claim is allowed.

#### ***Conclusion***

21. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within



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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khatol Shahnan-Shah whose telephone number is 571-272-0863. The examiner can normally be reached on Monday-Friday 7:30 AM-5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynette Smith can be reached on 571-272-0864.

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The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Khatol Shahnan-Shah. B.S.,  
Pharm, M.S.  
Biotechnology Patent Examiner  
Art Unit 1645  
March 28, 2008

/Shanon A. Foley/  
Supervisory Patent Examiner, Art Unit 1645